

Section B

Air

Table 2-9

U.S. Air Carrier^a Safety Data

	1960	1965	1970	1975	1980	1985	1990	1995	1996	1997	1998	1999 ^P
Total fatalities	499	261	146	124	1	526	39	168	380	8	1	12
Total seriously injured persons	N	N	107	81	19	30	29	25	77	39	28	57
Total accidents	90	83	55	37	19	21	24	36	38	49	^R 50	52
Fatal	17	9	8	3	1	7	6	3	5	4	1	2
Aircraft-miles (millions)	1,130	1,536	2,685	2,478	2,924	3,631	4,948	5,654	5,873	^R 6,692	^R 6,744	6,793
Rates per 100 million aircraft-miles												
Fatalities	^R 44.16	^R 16.99	^R 5.44	^R 5.00	0.034	^R 14.49	0.79	^R 2.97	^R 6.47	^R 0.12	^R 0.015	0.18
Seriously injured persons	N	N	^R 3.99	^R 3.27	0.65	0.83	0.59	0.44	^R 1.31	0.58	^R 0.42	0.84
Total accidents	^R 7.96	^R 5.40	^R 2.05	^R 1.49	0.65	0.58	0.49	0.64	0.65	0.73	^R 0.74	0.77
Fatal	^R 1.50	0.59	0.30	^R 0.121	0.034	0.19	0.12	0.053	0.085	0.060	0.015	0.029
Aircraft departures (thousands)	N	N	N	N	5,479	6,307	8,092	8,457	8,229	^R 10,314	^R 10,986	11,636
Rates per 100,000 aircraft departures												
Fatalities	N	N	N	N	0.018	^R 8.34	0.48	^R 1.99	^R 4.62	0.078	^R 0.0091	0.10
Seriously injured persons	N	N	N	N	0.35	0.48	0.36	0.30	0.94	0.38	^R 0.25	0.49
Total accidents	N	N	N	N	0.35	0.33	0.30	0.43	0.46	0.48	^R 0.46	0.45
Fatal	N	N	N	N	0.018	0.11	0.074	0.035	0.061	0.039	^R 0.0091	0.017
Flight hours (thousands)	N	4,691	6,470	5,607	7,067	8,710	12,150	13,505	13,746	^R 15,838	^R 16,846	17,428
Rates per 100,000 flight hours												
Fatalities	N	^R 5.56	^R 2.26	^R 2.21	0.01	^R 6.04	0.32	^R 1.24	^R 2.76	^R 0.051	^R 0.0059	0.069
Seriously injured persons	N	N	^R 1.65	^R 1.44	0.27	0.34	0.24	0.19	0.56	0.25	0.17	0.33
Total accidents	N	^R 1.77	0.85	0.66	0.27	0.24	0.20	0.27	0.28	0.31	^R 0.0059	0.30
Fatal	N	0.19	0.12	0.054	0.014	^R 0.080	0.049	0.022	0.036	0.025	^R 0.0059	0.011

KEY: N = data do not exist; P = preliminary; R = revised

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Table 2-9
Cont'd**U.S. Air Carrier^a Safety Data**

^a Air carriers operating under 14 CFR 121, scheduled and nonscheduled service. Includes all scheduled and nonscheduled service accidents involving all-cargo carriers and commercial operators of large aircraft when those accidents occurred during 14 CFR 121 operations. Since Mar. 20, 1997, 14 CFR 121 includes aircraft with 10 or more seats formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data for 14 CFR 121 and 14 CFR 135 with more recent data.

NOTES: Miles, departures, and flight hours are compiled by the U.S. Department of Transportation, Federal Aviation Administration. Rates are computed by dividing the number of fatalities, serious injuries, total accidents, and fatal accidents by the number of miles, departures, or flight hours. These figures are based on information provided by airlines to the U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information.

SOURCES:

Fatalities, accidents, miles, departures, and flight hours: 1960: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1967* (Washington, DC: December 1968).

1965-70: Ibid., *Calendar Year 1975*, NTSB/ARC-77/1 (Washington, DC: January 1977).

1975 (all categories except miles): Ibid., *Calendar Year 1983*, NTSB/ARC-87/01 (Washington, DC: February 1987), table 18.

1975 (miles): Ibid., *Calendar Year 1975*, NTSB/ARC-77/1 (Washington, DC: January 1977).

1980: Ibid., *Calendar Year 1981*, NTSB/ARC-85/01 (Washington, DC: February 1985), tables 2 and 16.

1985-99: National Transportation Safety Board, Internet site www.nts.gov/aviation/Table5.htm, as of May 8, 2000.

Serious injuries: 1970-90: Ibid. *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1995-99: Ibid., Analysis and Data Division, personal communications, Aug. 8, 1996; 1997; Mar. 10, 1999; Mar. 28, 2000.

Table 2-10

U.S. Commuter Air Carrier^a Safety Data

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 ^P
Total fatalities	37	37	7	^d 77	21	24	25	9	14	46	0	12
Total seriously injured persons	14	16	11	31	7	2	32	25	2	1	2	2
Total accidents	38	18	15	23	^e 23	16	10	12	11	^R 16	8	13
Fatal	8	7	4	8	7	4	3	2	1	5	0	5
Aircraft-miles (millions)	192	301	450	434	508	555	594	550	591	^R 252	^R 51	42
Rates per 100 million aircraft-miles												
Fatalities ^b	19.27	12.29	1.56	17.74	4.13	4.32	4.21	1.64	2.37	^R 18.28	0.00	28.57
Seriously injured persons ^b	7.29	5.32	2.44	7.14	1.38	0.36	5.40	4.55	0.34	^R 0.40	^R 3.94	4.76
Total accidents ^{b,c}	19.79	5.98	3.33	5.30	^R 4.53	2.88	1.68	2.18	1.86	6.37	^R 15.76	30.95
Fatal ^{b,c}	4.17	2.33	0.89	1.84	1.38	0.72	0.51	0.36	0.17	^R 1.99	0.00	11.90
Aircraft departures (thousands)	1,777	2,561	3,160	2,820	3,115	3,601	3,581	3,220	3,515	^R 1,394	^R 707	530
Rates per 100 thousand aircraft departures												
Fatalities ^b	2.08	1.44	0.22	2.73	0.67	0.67	0.70	0.28	0.40	3.30	0.00	2.26
Seriously injured persons	0.79	0.62	0.35	1.10	0.22	0.06	0.89	0.78	^R 0.057	^R 0.072	^R 0.28	0.38
Total accidents ^c	2.14	0.70	0.48	0.82	^R 0.74	0.44	0.28	0.37	0.31	^R 1.15	^R 1.13	2.45
Fatal ^c	0.45	0.27	0.13	0.28	0.23	0.11	^R 0.084	^R 0.062	^R 0.028	0.36	0.00	0.94
Flight hours (thousands)	1,176	1,737	2,342	2,292	2,335	2,638	2,784	2,628	2,757	983	^R 354	269
Rates per 100 thousand flight hours												
Fatalities	3.15	2.13	0.30	3.36	0.90	0.91	0.90	0.34	0.51	4.68	0.00	4.46
Seriously injured persons	1.19	0.92	0.47	1.35	0.30	^R 0.076	1.15	0.95	^R 0.073	0.10	^R 0.57	0.74
Total accidents ^c	3.23	1.04	0.64	1.00	^R 0.98	0.61	0.36	0.46	0.40	^R 1.63	^R 2.26	4.83
Fatal ^c	0.68	0.40	0.17	0.35	0.30	0.15	0.11	^R 0.076	^R 0.036	0.51	0.00	1.86

KEY: P = preliminary; R = revised

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Table 2-10
Cont'd

U.S. Commuter Air Carrier^a Safety Data

^a Air carriers operating under 14 CFR 135, scheduled service. Includes accidents involving all-cargo air carriers when those accidents occurred during scheduled 14 CFR 135 operations. Before March 20, 1997, 14 CFR 135 applied to aircraft with 30 or fewer seats. Since Mar. 20, 1997, 14 CFR 135 includes only aircraft with fewer than 10 seats. This change makes it difficult to compare pre-1997 data with more recent data.

^b Data updated by rounding to two significant digits instead of one.

^c Rates are based on all accidents, including some that involve operators not reporting mileage or other traffic data to the U.S. Department of Transportation

^d Total fatalities for 1991 do not include the 22 persons killed aboard an airliner when it and a commuter aircraft collided.

^e An attempted suicide case in 1992 is included in accidents but excluded in accident rates in this table.

NOTES: Miles, departures, and hours are compiled by the U.S. Department of Transportation, Federal Aviation Administration. Rates are computed by dividing the

number of fatalities, serious injuries, total accidents, and fatal accidents by the number of miles, departures, or flight hours. These figures are based on information provided by airlines to the U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information.

SOURCES:

Fatalities, accidents, aircraft-miles, aircraft departures and flight hours: 1980: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1980*, NTSB/ARC-83/01 (Washington, DC: January 1983), tables 26 and 40.

1985-99: Ibid., Internet site www.nts.gov/aviation/Table 8.htm, as of May 9, 2000.

Serious injuries: 1980-94: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1995-99: Ibid., Analysis and Data Division, personal communications, 1996; 1997; 1998; and Mar. 28, 2000.

Table 2-11 U.S. Air Carrier^a Fatal Accidents by First Phase of Operation^b

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Phase of operation										
Approach/descent/landing	1	2	1	0	2	2	0	0	0	1
Taxi/takeoff/climb	3	1	2	0	1	0	3	2	0	0
Cruise (inflight)	1	0	0	0	0	0	1	1	0	0
Standing (static)	1	1	1	1	0	0	0	1	1	1
Maneuvering ^c	0	0	0	0	1	0	0	0	0	0
Other/not reported	0	0	0	0	0	1	1	0	0	0
Total fatal accidents	6	4	4	1	4	3	5	4	1	2

^a 14 CFR 121, scheduled operations. Before Mar. 20, 1997, 14 CFR 121 applied only to aircraft with more than 30 seats or a maximum payload capacity of more than 7,500 pounds. Since Mar. 20, 1997, 14 CFR 121 includes aircraft with 10 or more seats that formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data with more recent data.

^b First phase of operation is the phase of flight in which the first occurrence leading to the accident happened.

^c Includes instructional flights performing turns and agricultural flights for spraying and buzzing (repeated passes over a particular location).

SOURCES: 1990-95: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues), table 18.

1996-97: Ibid., personal communication, Mar. 10, 1999 and Mar. 28, 2000.

Table 2-12 U.S. Commuter Air Carrier^a Fatal Accidents by First Phase of Operation

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Phase of operation										
Approach/descent/landing	0	3	5	1	2	0	1	2	0	0
Taxi/takeoff/climb	0	0	1	1	0	1	0	1	0	2
Cruise (in flight)	3	2	1	1	1	0	0	0	0	3
Standing (static)	0	1	0	1	0	0	0	0	0	0
Maneuvering ^b	1	1	0	0	0	1	0	2	0	0
Other/not reported	0	1	0	0	0	0	0	0	0	0
Total fatal accidents	4	8	7	4	3	2	1	5	0	5

^a 14 CFR 135, scheduled operations. Before Mar. 20, 1997, 14 CFR 135 applied to aircraft with 30 or fewer seats. Since Mar. 20, 1997, 14 CFR 135 includes only aircraft with fewer than 10 seats. This change makes it difficult to compare pre-1997 data with more recent data.

^b Includes instructional flights performing turns and agricultural flights for spraying and buzzing (repeated passes over a particular location).

SOURCES: 1990-95: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues), table 36.

1996-99: Ibid., personal communication, Mar. 10, 1999 and Mar. 28, 2000.

Table 2-13 U.S. On-Demand Air Taxi^a Safety Data

	1975	1980	1985	1990	1995	1996	1997	1998	1999 ^P
Total fatalities	69	105	76	51	52	63	39	^R 48	38
Total seriously injured persons	N	43	41	36	14	20	23	^R 10	14
Total accidents	152	171	157	107	75	90	82	^R 77	76
Fatal	24	46	35	29	24	29	15	^R 18	12
Flight hours (thousands)	2,526	3,618	2,570	2,249	1,707	2,029	2,250	2,538	2,809
Rates per 100,000 flight hours^b									
Fatalities ^R	2.73	2.90	2.96	2.27	3.05	3.10	1.73	^R 1.89	1.35
Seriously injured persons ^R	N	1.19	1.60	1.60	0.82	0.99	1.02	0.39	0.50
Total accidents ^R	6.02	4.73	6.11	4.76	4.39	4.44	3.64	^R 3.03	2.71
Fatal ^R	0.95	1.27	1.36	1.29	1.41	1.43	0.67	^R 0.71	0.43

^a Air carriers operating under 14 CFR 135, nonscheduled service. Accidents on foreign soil and in foreign waters are excluded.

^b Rates are computed by dividing the number of fatalities, serious injuries, total accidents, and fatal accidents by the number of flight hours.

NOTE: Hours are estimated by the U.S. Department of Transportation, Federal Aviation Administration.

SOURCES:

Fatalities, accidents and flight hours: 1975-80: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations, Calendar Year 1981*, NTSB/ARC-85/01 (Washington, DC: February 1985), table 61.

KEY: N = data do not exist; P = preliminary; R = revised

1985-99: Ibid., Internet site www.nts.gov/aviation/Table9.htm, as of May 10, 2000.

Serious injuries: 1980-90: Ibid., *Annual Review of Aircraft Accident Data: U.S. Air Carrier Operations* (Washington, DC: Annual issues).

1995-99: Ibid., Analysis and Data Division, personal communications, 1996; 1997; 1998; and Mar. 28, 2000.

Table 2-14

U.S. General Aviation^a Safety Data

	1960 ^d	1965 ^d	1970 ^d	1975	1980	1985	1990	1995	1996	1997	1998	1999 ^P
Total fatalities	787	1,029	1,310	1,252	1,239	956	767	734	632	^R 643	^R 623	628
Total seriously injured persons	N	N	715	769	681	483	402	395	359	365	^R 330	325
Total accidents^b	4,793	5,196	4,712	3,995	3,590	2,739	2,215	2,053	^R 1,908	^R 1,853	^R 1,909	1,908
Fatal	429	538	641	633	618	498	443	412	360	^R 353	^R 365	342
Flight hours (thousands)	13,121	16,733	26,030	28,799	36,402	28,322	28,510	24,906	24,881	^R 25,464	26,796	27,080
Rates per 100,000 flight hours^c												
Fatalities	6.00	6.15	5.03	4.35	3.40	3.38	2.69	^R 2.95	2.54	^R 2.53	^R 1.95	2.32
Seriously injured persons	N	N	2.75	2.67	1.87	1.71	1.41	^R 1.59	1.44	1.43	^R 1.23	1.2
Total accidents	36.53	^R 31.05	^R 18.10	^R 13.87	^R 9.86	^R 9.66	^R 7.77	^R 8.23	^R 7.67	^R 7.28	^R 7.12	7.05
Fatal	3.27	3.22	2.46	2.20	^R 1.70	^R 1.75	1.55	1.64	1.45	^R 1.39	^R 1.36	1.26

^a U.S. registered civil aircraft not operated under 14 CFR 121 or 14 CFR 135. Accidents on foreign soil and in foreign waters are excluded. Suicide/sabotage cases included in accidents and fatalities but excluded from accident rates in this table are: 1985 (3 accidents, 2 fatal accidents); 1990 (1,0); 1995 (4,3).

^b Since April 1995, the National Transportation Safety Board has been required by law to investigate all public-use accidents, increasing the number of NTSB reported general aviation accidents by approximately 1.75%.

^c Rates are computed by dividing the number of fatalities, serious injuries, total accidents, and fatal accidents by the number of flight hours.

^d Data for 1960, 1965, and 1970 include air taxi.

NOTE: Flight hours are estimated by the U.S. Department of Transportation, Federal Aviation Administration.

SOURCES:

KEY: N = data do not exist; P = preliminary; R = revised

Fatalities, accidents, and flight-hours: 1960-70: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: U.S. General Aviation, Calendar Year 1970*, NTSB/ARG-74/1 (Washington, DC: April 1974), table 117.

1975-80: Ibid., *Annual Review of Aircraft Accident Data: General Aviation, Calendar Year 1985*, NTSB/ARG-87/03 (Washington, DC: October 1987), table 21.

1985-99: Ibid., Internet site www.nts.gov/aviation/Table10.htm, as of May 10, 2000.

Serious injuries: 1970-95: National Transportation Safety Board, *Annual Review of Aircraft Accident Data: General Aviation* (Washington, DC: Annual issues).

1995-99: Ibid., Analysis and Data Division, personal communications, 1996; 1997; 1998; and Mar. 28, 2000.

Table 2-15
Number of Pilot-Reported Near Midair Collisions (NMAC) by Degree of Hazard

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998 ^R	1999
Degree of hazard												
Critical ^a	118	180	74	52	46	35	47	32	26	31	22	24
Potential ^b	319	423	266	197	195	158	139	139	101	105	97	100
No hazard ^c	122	133	114	99	70	61	71	63	55	70	52	55
Unclassified ^d	9	22	0	0	0	0	0	0	0	0	0	0
Open ^e	0	0	0	0	0	0	18	4	12	30	37	73
Total	568	758	454	348	311	254	275	238	194	236	208	252
NMAC involving aircraft operating under 14 CFR 121 ^f	U	U	121	101	72	60	63	43	49	81	64	63

^a A situation where collision avoidance was due to chance, rather than an act on the part of the pilot. Less than 100 feet of aircraft separation would be considered critical.

^b An incident that would probably have resulted in a collision if no action had been taken by either pilot. Less than 500 feet would usually be required in this case.

^c When direction and altitude would have made a midair collision improbable, regardless of evasive action taken.

^d No determination could be made, either due to insufficient evidence or unusual circumstances.

^e Incidents that are still under investigation.

^f Before Mar. 20, 1997, 14 CFR 121 applied only to aircraft with more than 30 seats or a maximum payload capacity of more than 7,500 pounds. Since Mar. 20, 1997, 14 CFR

121 includes aircraft with 10 or more seats that formerly operated under 14 CFR 135. This change makes it difficult to compare pre-1997 data with more recent data.

NOTE: Includes air carriers, general aviation, military, and other aircraft involved in public-use operations.

SOURCES: U.S. Department of Transportation, Federal Aviation Administration, *Aviation Safety Statistical Handbook Annual Report* (Washington, DC: Annual issues).

NMAC involving 121 aircraft: Ibid., Air Traffic Resource Management, personal communications, Mar. 18, 1999 and May 22, 2000.

KEY: R = reversed; U = data are not available

Table 2-16

Airline^a Passenger Screening Results by Type of Weapons Detected, Persons Arrested, and Bomb Threats Received

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Persons screened (millions)	585	993	1,145	1,015	1,111	1,150	1,261	1,263	1,497	1,660	1,903	1,754
Type of weapon detected												
Firearms												
Handguns	1,878	2,823	2,490	1,597	2,503	2,707	2,860	2,230	1,999	1,905	1,401	1,421
Long guns	36	90	59	47	105	91	134	160	156	162	114	131
Total	1,914	2,913	2,843	1,644	2,608	2,798	2,994	2,390	2,155	2,067	1,515	1,552
Other/other dangerous articles ^b	108	74	304	275	N	N	N	N	N	N	N	N
Explosive/incendiary devices	8	12	15	94	167	251	N	N	N	N	N	N
Persons arrested												
Carrying firearms/explosives	1,031	1,310	1,336	893	1,282	1,354	1,433	1,194	999	924	660	633
Giving false information	32	42	18	28	13	31	35	68	131	72	86	58
Bomb threats received												
Against airports	1,179	477	448	498	188	304	250	346	N	U	U	U
Against aircraft	268	153	338	388	215	248	218	327	N	U	U	U

^a Includes operators with a U.S. Department of Transportation, Federal Aviation Administration operating certificate engaged in scheduled passenger or public charter passenger operations and airports at which these operations are conducted.

^b In 1980 and 1985, the "Other" category was included with firearms; in 1990, "Other" became "Other Dangerous Articles."

SOURCES:

Persons screened and persons arrested: 1980-85: U.S. Department of Transportation, Federal Aviation Administration, *Semiannual Report to Congress on the Effectiveness of the Civil*

Aviation Security Program, July

1-December 31, 1985 (Washington, DC: May 1986).

1990-99: Ibid., Office of Civil Aviation Security Policy and Planning, *Annual Report to Congress on Civil Aviation Security* (Washington, DC: Annual issues), and personal communications, May 27, 1999 and Mar. 29, 2000.

Bomb threats received: Ibid., *Criminal Acts Against Civil Aviation* (Washington, DC: Annual issues).

KEY: N = data do not exist; U = data are not available